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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/730,162

12/08/2003

Yushi Ono

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EXAMINER

LUKS, JEREMY AUSTIN

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/730,162

Applicant(s)

ONO ET AL.

Examiner

Jeremy A. Luks

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/1/04, 5/5/05, 7/7/05, 9/15/05, 2/16/06</u>                              | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

1. Applicant is advised that should Claim 1 be found allowable, Claim 14 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4, 6-8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Watanabe (US 2002/0027997).

With respect to Claims 1, 2 and 4 and 14, Ward discloses a base layer (Figure 1, #11) having a woven fabric of a fiber impregnated with a thermosetting melanine resin (Col. 1, Lines 51-53), whereby the fiber is coated with a second thermosetting resin (Col. 2, Lines 56-58). Ward fails to disclose polyethylene naphthalate fibers. However, Watanabe discloses the use of polyethylene naphthalate fibers (Page 6, [0076]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the loudspeaker diaphragm of Ward with the materials of Watanabe because of their mechanical strength, sound absorbing efficiency and availability in the market place.

With respect to Claim 6, Watanabe discloses a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20 by weight (Page 6, [0075], [0077]).

With respect to Claims 7 and 8, Ward discloses a vinyl resin based thermoplastic resin layer (Col. 2, Lines 5-10).

Claims 9-12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Watanabe (US 2002/0027997), and further in view of Kanada (US 2002/0045040).

With respect to Claims 9 and 10, Kanada discloses a thermoplastic elastomer layer containing at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer (Page 2, [0014]).

With respect to Claims 11 and 12, Kanada discloses a foamed structure (Page 3, [0021]), wherein an average diameter of a cell in the foamed structure is 10 to 60  $\mu\text{m}$  (Page 3, [0026]).

With respect to Claims 15 and 16, Ward and Watanabe are relied upon for the reasons and disclosures set forth above. Ward also discloses curing the thermosetting resin, so as to form a base layer (Col. 2, Lines 33-38). Watanabe also discloses laminating multiple layers (Page 8, [0093]). Ward and Watanabe fail to disclose adding an inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer. Nevertheless, Kanada discloses adding the inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and laminating the base layer and the thermoplastic resin layer (Page 2, [0018]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the structures of Ward and Watanabe with the materials and methods of Kanada in order to provide a laminate that is thin and has excellent flexibility, while maintaining a high level of soundproofing characteristics.

Claims 3 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Watanabe (US 2002/0027997), in view of Kanada (US 2002/0045040), and further in view of Yamaji (5,055,341).

With respect to Claims 3 and 20, Ward, Watanabe and Kanada are relied upon for the reasons and disclosures set forth above. Ward, Watanabe and Kanada fail to disclose the base fiber being a monofilament. Nevertheless, Yamaji discloses base fiber being a monofilament (Col. 2, Lines 46-50).

With respect to Claims 17 and 18, Ward, Watanabe and Kanada are relied upon for the reasons and disclosures set forth above. Ward, Watanabe and Kanada fail to disclose a thermoplastic resin layer composed of a film. Nevertheless, Yamaji discloses a thermoplastic resin layer as an intermediate layer composed of a film (Col. 5, Lines 57-61).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the structures of Ward, Watanabe and Kanada with the materials and methods of Yamaji because of their lightweight and heat resistant characteristics, as well as high productivity at a low cost.

With respect to Claim 19, Ward, Watanabe and Kanada are relied upon for the reasons and disclosures set forth above. Yamaji discloses the thermoplastic elastomer constituting the thermoplastic elastomer layer having a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer (Col. 6, Lines 23-35).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Watanabe (US 2002/0027997), and further in view of Thomas (EP 0508596 A1). Ward and Watanabe are relied upon for the reasons and disclosures set forth above. Ward and Watanabe fail to disclose a base layer comprising an unwoven fabric of a liquid crystal polymer. Nevertheless, Thomas discloses a base layer comprising an unwoven fabric of a liquid crystal polymer (Col.1, Lines 34-42).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the structures of Ward and Watanabe with the apparatus of Thomas because a liquid crystal polymer provides substantially better resistance to

moisture and to elevated temperature than traditional materials, as well as its good fatigue resistance to survive the rigors of high output sound reproduction over extended periods of time.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Watanabe (US 2002/0027997), in view of Inoue (6,378,649), and further in view of Ogura (5,744,761). Ward and Watanabe are relied upon for the reasons and disclosures set forth above. Ward and Watanabe fail to disclose a thermosetting resin as an unsaturated polyester resin and a second thermosetting resin as an epoxy resin or a melamine resin. However, Inoue discloses a thermosetting resin as an unsaturated polyester resin (Col. 3, Lines 11-12). Inoue fails to disclose a second thermosetting resin as an epoxy resin or a melamine resin. Nevertheless, Ogura discloses a second thermosetting resin as an epoxy resin or a melamine resin (Col. 5, Lines 27-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the structures of Ward and Watanabe with the material of Inoue for their high elasticity and large internal loss, while providing excellent flexibility; and the materials of Ogura because they are sufficient to impart stiffness on a cloth after cooling to ambient temperatures.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pertinent arts of record relating to loudspeaker diaphragms are disclosed in the PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy A. Luks whose telephone number is (571) 272-2707. The examiner can normally be reached on Monday-Thursday 8:30-6:00, and alternating Fridays 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Bradley can be reached on (571) 272-2800 x33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeremy Luks  
Patent Examiner

Art Unit 2837



**Edgardo San Martin**  
**Primary Patent Examiner**